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Six Sigma: Is It Worth the Hype?

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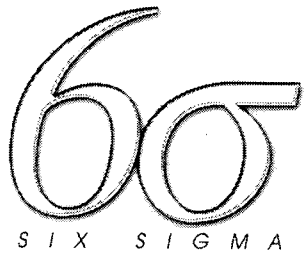
Abstract

Six Sigma is a process for reduction of variation in processes to a level of 3.4 errors per one million opportunities. The paper analyzes whether or not Six Sigma is worth the hype using several angles. The background and history of Six Sigma along with its beginnings at Motorola and General Electric are examined to establish a foundation for argument. A thorough analysis of Six Sigma usage currently is conducted, and four keys to success are discussed including ability to handle a large capital outlay, commitment, follow through, and a change-based culture. In addition, factors that cause Six Sigma to fail are mentioned and include focusing too much on the bottom line, little management support, bad employee talent allocation, and poor project supply, selection, and scope. With these points recognized, it was found that there are several misconceptions of Six Sigma including Six Sigma's negative affect on stock price and the notion that Six Sigma is a "magic bullet" that solves all problems easily. To conclude, it is argued that, based on findings, Six Sigma is absolutely worth the hype. These findings are based on the need for quality, cost savings, and process streamlining in business operations.



I. Introduction – Six Sigma History and Origin

Six Sigma is one of the hottest topics in the business world today and shows no sign of disappearing soon. It is the focus of many books and publications, but few people know exactly what it is. Thus, it is imperative that one should first understand how the process for quality control became so popular before analyzing its relevance in today's business world. Established by Motorola, and taken to the next level by the likes of General Electric, Allied Signal, and Bank of America, this tool for business quality control has been around for less time than one might think. "The process was pioneered by Bill Smith at Motorola in 1986 and was originally defined as a metric for measuring defects and improving quality, and a methodology to reduce defect levels below 3.4 Defects Per Million Opportunities (DPMO)" ("Six Sigma"). To put it into much different but easier to understand terminology, "In golfing terms, that's like an avid golfer missing one putt about every 163 years" (Clark).

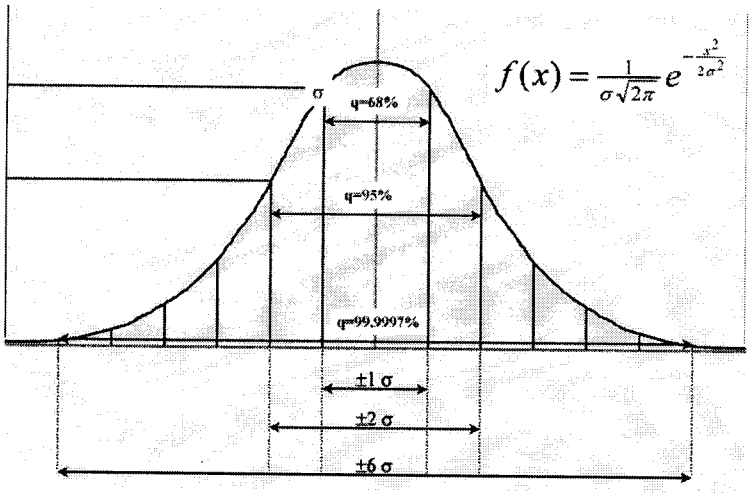
Not surprisingly, Bill Smith is often referred to widely as the "Father of Six Sigma". Smith was actually working at Motorola when he was able to convince management, after much resistance, that his technique called Six Sigma was a great way to reduce errors and instill quality in processes and design. Shortly thereafter, Bob Galvin, CEO of Motorola at the time, implemented his plan, and the rest is history. In fact, it was much to Smith's credit that Motorola won the first national Malcolm Baldrige Award in 1988 for excellence in quality (Chadwick). "Baldrige Award winners agree to share their quality programs with anyone who is interested.

[Smith's daughter Marjorie] Hook said that since Motorola was the first company to win, others were eager to learn more about Six Sigma. 'That's one of the primary reasons Six Sigma became so widely known,' she said" (Chadwick). Soon after Motorola's implementation of Six Sigma, Bill Smith traveled extensively helping other companies with their quality issues. He was able to convince many companies and organizations of the importance of Six Sigma. This type of work is what made Smith truly complete, but unfortunately he suffered a heart attack while on the job shortly following Motorola's acceptance of the Baldrige Award (Chadwick).

While Six Sigma is officially credited to Bill Smith and Motorola, the actual fundamental breakdown of the process is something that is not so new at all. "In fact, Bill Smith did not really "invent" Six Sigma in the 1980s; rather, he applied methodologies that had been available since the 1920s developed by luminaries like Shewhart, Deming, Juran, Ishikawa, Ohno, Shingo, Taguchi and Shainin" ("Six Sigma"). Smith more or less created a summation of the processes available to him into something that would work for his needs. It is unfair to not give him credit where credit is due, however, because without his input, Six Sigma might not have ever become a mainstream term. However, Motorola has quite a debt of gratitude to pay to Smith at least in part, because since Six Sigma's inception at the company, the reported savings of the initiative have reached $17 billion ("Six Sigma").

In order to determine if Six Sigma is "worth the hype" or not, one must understand what exactly is included in the Six Sigma process. It can be recognized after reading the previous paragraphs that Six Sigma is a process that systematically aims at the reduction of errors in processes and cycles. Again, this is done so that there are fewer than 3.4 errors per million opportunities. In order to achieve this goal, Six Sigma mainly deals with statistical variances and measures these variances using standard deviations. By using a normal distribution curve, the

mean or target output is placed in the middle of the curve. Records indicate what the range of activity is for this particular process. Once this is done, acceptable limits must be set so the activity can be controlled. For instance, the observed process might be how long it takes a customer to go through a drive thru window at a fast food restaurant. If the mean time is targeted to be eight minutes, the upper limit could be ten minutes and the lower limit could be six minutes. For an organization to operate at Six Sigma, there must be less than 3.4 instances per million customers that drive thru times exceed 10 minutes or are shorter than 6 minutes. To better illustrate this concept, the Six Sigma diagram below shows a regular distribution curve and the possible levels of Six Sigma.



("Related Process Models – The Six Sigma Model")

Before the statistics intimidate or confuse, another simple explanation is in order. Six Sigma focuses on how many instances of a procedure fall outside the acceptable limits. For instance:

> Consider that you run a pizza delivery business and you set a target of delivering pizzas within 25 minutes of receiving the order. If you achieve that 68% of the time, you are running at 1 Sigma. If you achieve it 99.9997% of the time then you are at 6 Sigma (or

you are late on average only 3.4 times out of every one million orders)
("Related Process Models – The Six Sigma Model")

Consequently, when businesses talk about embarking on Six Sigma and trying to achieve Six Sigma quality, they are mainly, but not entirely, focused on reducing the amount of variation in one or more of their processes. It is using this statistical analysis that helps them lower the firm's cost of poor quality. Instead of internal and external costs of poor quality, there can be a comparatively much smaller amount invested in error and variation prevention. Nevertheless, Six Sigma also is able to deal with other things besides variation such as assisting in totally revising the way a process is carried out and other complicated measures. However in general, the Six Sigma process is one aimed at reduction of variance, where variance is errors that signal a decrease in quality or a hiccup in the production line (as demonstrated in the example above).

At this point, a sufficient background of the actual human resources and procedural aspects needed for a Six Sigma initiative should be examined. There are essentially five layers of personnel that are involved in the activity of any Six Sigma project or initiative. These five layers are defined and placed in a hierarchy which resembles the sport of karate. The five distinguished levels of the Six Sigma approach are Executive Leaders, Champions, Master Black Belts, Black Belts, and Green Belts (in order from most experienced to least experienced) (Brue 80). The Executive leaders are the high level individuals who decide to implement and carry out Six Sigma. Being the chief decision makers of the organization, they play perhaps the most crucial role in the process (Brue 80). It is their blessing or the lack thereof that instantly can dictate the success of the initiative. They set the tone for the implementation of the Six Sigma initiative, and ensure that it is given proper attention on the organizational level.

The Executive Leaders of the organization then designate Champions who "[...] are critical to the success or failure of any Six Sigma project. The concept of 'champion' dates back

to the Middle Ages, to a word for field or battleground. A champion was someone who took the field to battle for a cause" (Brue 83). In this respect, the Champion makes sure that the process is streamlined and that individuals can accomplish the goals they set out to tackle. Also, the Champion has several other roles which include overseeing the entire process and making sure the projects that are selected are in line with the goals and available resources of the company. The Champion is responsible for making sure the project is carried out correctly and that the correct personnel are selected for the job. Finally, it is the Champion's job to educate the masses and motivate the Six Sigma teams (Brue 84-85).

Master Black Belts are the next level and have a very essential role to play as well. "The master black belt is an expert in Six Sigma tools and tactics and a valuable resource in terms of technical and historical expertise. Teacher, mentor, and lead agent of change, the Master Black Belt ensures that the necessary infrastructure is in place and that black belts are trained"(Brue 85). Without a Master Black Belt, the process may very well fall apart. These individuals are the mentors of the group, and must take careful action in preparing their staff for their projects.

Black Belts are the next level in the succession of Six Sigma dignitaries. The Black Belts operate at the very ground level of the Six Sigma operation. "The project leader is called a Black Belt (BB). [...] A BB assignment typically lasts for two years during which the BB leads from eight to 12 projects, each lasting approximately one quarter" (Lucas 28). The Black Belts are usually assigned one project at a time to complete, and work exclusively on Six Sigma operations. "The projects will likely come from different business areas, thereby giving the BB a broader view of the business" (Lucas). "They are trained to dig into the chronic and high-impact issues and fix them with Six Sigma techniques and practices. It sounds quite simple; they fix the problems, get rid of the defects, and find the money" (Brue 86). Overall, a company might have

several Black Belts all working together under the Six Sigma leadership that is in place. These Black Belts report directly to the Champion and Master Black Belts.

Finally, the Green Belts are the last in the succession of Six Sigma personnel. The Green Belts essentially allow Six Sigma to partially replace part of their daily activities, but also have a full-time commitment to another functional area of the company (Brue 87). They provide assistance to the rest of the process and apply Six Sigma as needed in their functional area. Although it might seem as if the Green Belts are not as critical to the process as the other layers of Six Sigma personnel, they do play a significant role. The Green Belts undergo some formal training, but not nearly the amount that the Black Belts undergo. All in all, the entire group of individuals works together to make Six Sigma success a reality.

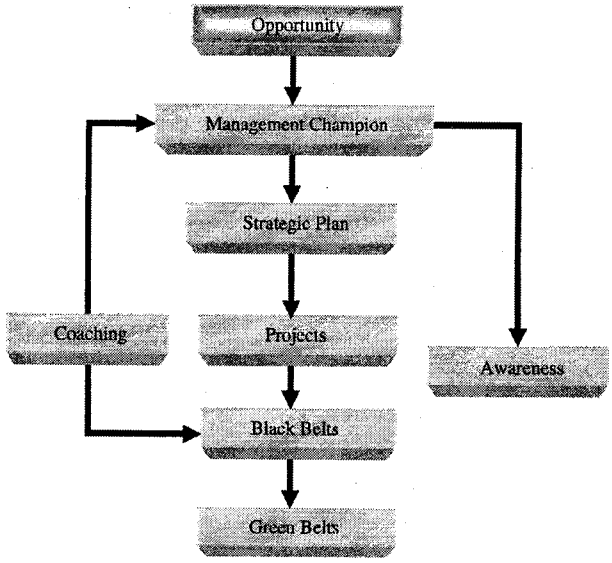


Figure 4.1 Six Sigma Deployment model.

(Adams, Gupta, and Wilson 59)

The diagram above gives real insight into the process as it continues down throughout the organization. As one can see, the "opportunity" at the top of the diagram is one that is presented to every organization. If the executive leadership decides to use Six Sigma to allow it to help

take advantage of the opportunity, they delegate the responsibility downward and start the process. Also in the diagram, one can see the incredible responsibility of the Champion who has to coach the Black Belts and raise positive awareness for the initiative throughout the entire company. It is this step that is very difficult, and the Champion can very well dictate how the projects are carried out. Finally, the progression from the Black Belts to the Green Belts can be seen along with how the entire process comes together. The Six Sigma process is one that might be slightly different at various corporations, but the main idea is that there is one unified team that is responsible for the Six Sigma efforts of the entire enterprise.

On the other hand, the personnel involved in Six Sigma are not the only variable in Six Sigma. There also have been changes in the process itself over the years. It is important to note that there are two main approaches to Six Sigma, one of which is not the approach that was always used. When Motorola first began utilizing Six Sigma, it utilized something that was later coined as the traditional approach. "The traditional approach to Six Sigma involves the steps that focus on discovering customers' critical requirements, developing process maps, and establishing key business indicators"(Gupta, "Business Scorecard" 22). Once this is done, the company truly knows what the customer wanted and how the business was currently attempting to gain the customers' satisfaction. "After these steps are completed, the business moves on to review its performance against the Six Sigma standards of performance and takes actions to realize virtual performance" (Gupta "Business Scorecard" 22). Motorola required their top leadership to become educated in the area of Six Sigma so that their company could have a successful deployment of Six Sigma. Employees were empowered to speak up to their managers and supervisors so that everyone was in the loop (Gupta, "Business Scorecard" 23). As a result, the

company became very successful with Six Sigma and it was permanently planted in the company's culture.

The newer approach to Six Sigma is called the Breakthrough approach and was developed by Mikel Harry and Richard Schroeder (Gupta, "Business Scorecard" 23). This approach incorporates the (DMAIC) method that is widely known. The following is a summary of the approach:

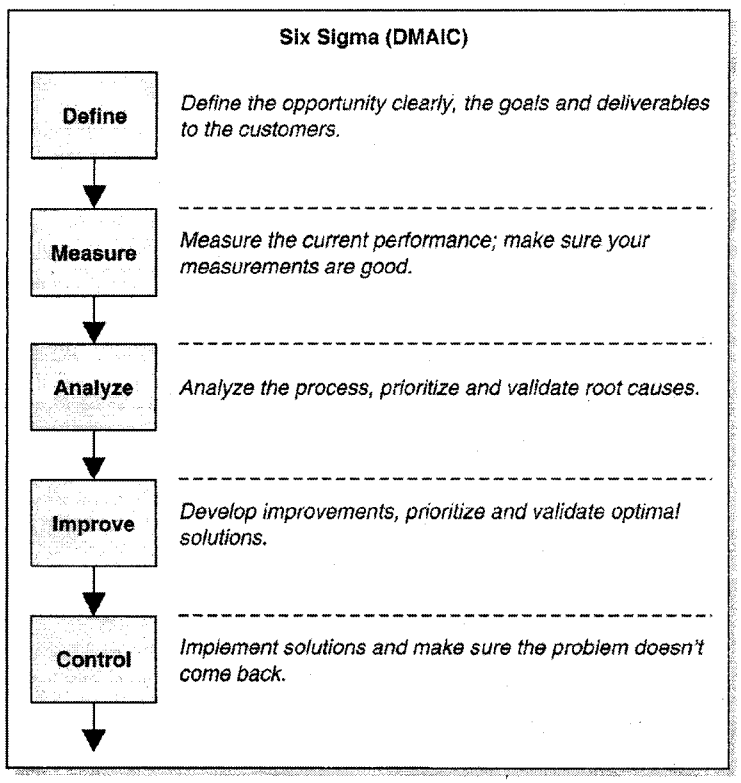


Figure 2.5 Classical DMAIC Steps

(Abromowich 47)

There are other approaches as well that are intended to be used in unison with Six Sigma develop improved processes. The DMADV method (Define, Measure, Analyze, Design, and Verify) is a method used in creating new business processes in order to solve current problems for the company. For the practical purpose of this topic, it is not overly imperative to understand all of

the details of both the DMAIC and the DMADV methods. This is because many different variations exist, and each is for different uses in various corporate situations. However, what is important is that one understands that Six Sigma is a very methodical process and the steps listed above are taken into account almost without avail. Furthermore, understanding these methods will help in understanding the arguments against Six Sigma and the counterarguments contributing positive aspects of Six Sigma.

Along with Six Sigma, there is a toolset called Sigma Lean that often accompanies or follows Six Sigma. Both have the aim of improving quality and eliminating waste around the business, but the method of doing this is slightly different in one respect. According to Gupta, "Six Sigma requires doing a job well, and Lean requires doing a job fast. The combination of Six Sigma and Lean drives excellence and efficiency together, which affects quality, productivity, and profitability" ("Performance Handbook" 16). Hence, most companies try to eliminate the waste they have in their processes by using Six Sigma and its methodology. When this is done, often times Sigma Lean is used almost simultaneously to increase the rate at which processes are done. "Continual improvement at a dramatic rate is a critical part of Lean thinking for sustaining Lean operations" (Gupta, "Performance Handbook" 17). Some of the tools used in Sigma Lean include flow manufacturing, multi-process handling, Kanban, and Poka Yoke (Abramowich 49). The use of both Six Sigma and Sigma Lean are very significant in manufacturing processes. Along with the speed of the process, Sigma Lean also incorporates safety in the mix. Thus, these two processes often go hand in hand in working toward ultimate success in quality and efficiency at an organization.

All things considered, Six Sigma is definitely a sophisticated process and it is hard to achieve success with it as many companies have found. Nevertheless, many companies continue

to implement it partially or totally in a full deployment. Six Sigma is not necessary for all companies, however. To figure out which companies and organizations should use Six Sigma, it is important to look at why companies elect to implement Six Sigma. First of all, the organizations that adopt Six Sigma are most interested in increasing quality, providing consistency, reducing the cost of poor quality, and also increasing positive relationships with their customers. Innovation in the corporate world has now more than ever become a must for both major players and fledgling companies. "Countless companies proclaim, '...our people are our most important resources!' But few really ever take full advantage of their people. Unless a company is lucky enough to provide a service or product without competition, it needs to find ways to stay ahead of the gang of competitors eager to take [...] customers and market share" (Barata). Six Sigma allows companies to do just that and take advantage of their human resources. The business world is ultra-competitive today, and without an edge over the competition, a company can be doomed almost instantly.

Mentioned in the previous paragraph is the concept of the Cost of Poor Quality. In today's world as well in many years past, the COPQ has played a big role in the expenses of a business. Rework, warranties, inspection, supervising of processes, and bad customer service are a few of the many costs and negative impacts that poor quality has on an organization. Interestingly enough, "[Joseph] Juran [...] estimated that, 'in the United States, close to a third of the work done consisted of redoing what had been done before. Depending on the nature of the industry, the COPQ consumed between 20 and 40% of the total effort'" (Lucas 28). It is no wonder that many companies have elected to implement Six Sigma to see if it can work as effectively for their companies as with Motorola and General Electric. Consequently, it is safe to

assume that under the circumstances under which Six Sigma has been presented, most any company could benefit from such a quality control methodology.

Before analyzing Six Sigma from a present day view, a brief example of a project and its outcome should be shown. The following is a sampling of how Six Sigma can truly make a difference at a company:

> GE also manages access time to 12 satellites, mostly for TV and radio programming. It found it assigned time haphazardly, much like an untidy person puts things in a closet, says Senior Vice President Walter Braun. Using Six Sigma to organize the closet, GE added $1.3 million a year in revenue by utilizing the satellites 97% of the time vs. 63%. (Jones)

Coupled with several other concurrent initiatives such as the one mentioned above, a large company could realize substantial gains and savings through cost cutting. It would seem as though this example of Six Sigma would be self-explanatory and not necessarily requiring statistics at all. However, do not discredit statistics as they are widely in use as a part of Six Sigma.

II. Six Sigma Today

With an established understanding of what Six Sigma is and where it came from, now it can be discussed more in present-day terms. Today, Six Sigma is a tool that is used by companies that are of various sizes and are both public and private entities. It is easier to find out some information regarding the physical usage of Six Sigma by companies that are publicly held, because they are forced to disclose information regarding expenditures they have made. However, as far as the individual projects and undertakings these companies are pursuing, it is much harder to acquire information. These publicly held companies do not disclose much information about their successes and savings, because that information is considered proprietary and confidential. However, Six Sigma savings these publicly held companies report are

sometimes disclosed in hopes that the savings that they announce will lure potential investors and positive publicity. Fortunately, it is much easier to find out whether the company uses Six Sigma in general. Regarding the top companies in the nation and namely the Fortune 500, Michael Cyger comments on Six Sigma utilization rates in his article called "Riding the Bandwagon". The article states:

> Recent Six Sigma research has revealed that 82% of the top 100 publicly traded companies in the United States use Six Sigma. That magnitude didn't surprise me. What was surprising was that when you look at the top 500 companies, the proportion drops to 53%, and that within that group there are only about 100,000 Black Belts and Master Black Belts among nearly 25 million employees.

This testament was taken from late in 2006, and undoubtedly will increase with time as more and more people find ways to implement Six Sigma at their companies. However, it is uncertain if all companies currently using Six Sigma will continue using it, as quite a few companies are not experiencing success on track with what Motorola and General Electric have realized. This will be addressed after first establishing more of a background of Six Sigma.

Some of Six Sigma's biggest success stories have taken place at Motorola, General Electric, and Honeywell. As stated earlier, Motorola's savings are numerated at $17 billion. Following Motorola's great success, General Electric made Six Sigma a household name and took the system to the next level. Taken from what Motorola had done, Jack Welch and General Electric attempted to make it not only a tool but a culture-embedded initiative. As a result, "GE reported Six Sigma as a contributor to its growth, higher profit margins, and overall value to shareholders. The savings due to Six Sigma have been cited in hundreds of millions of dollars" (Adams 174). Finally, Honeywell, which grew after Allied Signal and Honeywell merged, has also experienced phenomenal growth using the system. "Overall, Honeywell has reported about $2.0 billion in cumulative savings from Six-Sigma-related activities. Honeywell expects to save

about $500 million per year using the Six Sigma Plus methodology [Allied Signal and Honeywell's proprietary blend of Six Sigma]" (Adams 176). As it can be seen, Six Sigma has had quite an influence on its early adopters. One must realize, however, that not every Six Sigma deployment has had the same magnitude of success. For instance, there are several small companies, which even with a perfect deployment and utilization, cannot nearly come close to the marks attained by the larger corporations.

Today, Six Sigma is used not only in manufacturing, but also in the service sector. However, this was not always the case, and it took a bit of modification and open thinking to realize success with Six Sigma when using it outside of manufacturing. Several service sector companies "[...] conclude that their organization or function is different, and therefore Six Sigma doesn't apply to them. In many cases, this conclusion is just one of honest ignorance, in others it is a form of denial, and in others it is a convenient excuse to avoid change [...]" (Snee and Hoerl 36). Through the evolution of Six Sigma, several companies including Bank of America have extended their operations to encompass Six Sigma. Others include Albertson's, Home Depot, Capital One Financial, and Federated Department Stores (Cyger, "Missing Link"). Not all have experienced the same level of success as the mainstream manufacturing trademark companies. However, they have made strides in their own right and continue to utilize Six Sigma in their daily business transactions.

In addition, there is an aura of mystery that surrounds Six Sigma in today's business arena. Even with the proven successes of previous companies, there are still doubters that are afraid or resistant to bring Six Sigma on board fearing the unknown. Some conclude that Six Sigma is a "fad" and that it will pass with time. Certain business leaders and media analysts feel this way for several reasons. Back in 1998, Del Jones commented in an article in USA Today

saying, "Today, depending on whom you listen to, Six Sigma either is a revolution slashing trillions of dollars from corporate inefficiency, or it's the most maddening management fad yet devised to keep front-line workers too busy collecting data to do their jobs." Currently, there is still a sense that Six Sigma is a fad, but it can be concluded that Jones was being exaggeratory in both assessments of Six Sigma. Six Sigma is not the holy grail of business operations, but it should not be the outcast of business operations either. Clearly certain companies can make great use of the tool, while others either don't need it or cannot execute it effectively.

It must also be understood that Six Sigma is not a fad, but it is not a quick fix either. In the words of Charles Waxer, a Six Sigma guru, "Six Sigma is not a 'get rich quick' methodology. I like to think of it like my retirement savings plan – Six Sigma is a get rich slow methodology – the take-away point being that you will get rich if you plan properly and execute consistently" (Waxer). It is this description that positions Six Sigma largely in unison with the common pitfalls of dieting to lose weight. Just like Six Sigma, dieting will only prevail over the long term and takes dedication and a cultural change on the personal level. Otherwise, any diet will be just like what many critics say of Six Sigma, a "fad".

Regardless of whether Six Sigma is a "fad", there is another vital underlying issue that constantly surrounds Six Sigma. This simple issue is best described by one word, "change". In the words of late president Woodrow Wilson, "If you want to make enemies, try to change something" ("Two Favorite Quotes"). It is very evident in mainstream culture that people are change-averse and that they do not like doing things differently after getting comfortable with one method. Six Sigma is centered on change; in fact, it is change (Cyger, "Riding Bandwagon"). It could be estimated that one of the American business society's biggest problems is that it is has a difficult time with change. A remark from Cyger argues, "Just

remember: There's no advantage to being complacent. In the not-too-distant past, many people thought that computer word processing was too difficult to learn and that its novelty would pass" ("Riding Bandwagon"). Today it is easy to discount this statement, but the fact remains that people honestly felt the way Cyger comments on. Without knowing the future it is hard to predict much of anything. It could be reasoned that Six Sigma is currently in a stage of late growth to possible early maturity. The problem is that no one knows when Six Sigma will reach maturity. Thus, Six Sigma as an entity is truly controversial and has not been fully accepted by the business community.

III. Six Sigma: Four Keys to Success

As with most things, there is always a downside, and Six Sigma is not an exception to that rule. There are several instances that are less than ideal for a Six Sigma deployment. Due to the characteristics that cause Six Sigma to fail, many people think that Six Sigma is not working correctly. Thus, because it does not work, they believe that Six Sigma is not worth the time and effort that must be put into it. However, these companies or individuals are probably those that have experienced less than spectacular results using Six Sigma or have read about instances where Six Sigma has not produced up to expectations.

Consequently, there are four major areas that must be satisfied in order for Six Sigma to work. The first of these is that the potentially large capital outlay for Six Sigma needs to be one that the organization can sustain in good form. The second and third areas fit together in a sense as they are both qualitative in nature. These two qualities are commitment and follow through, and without either one, Six Sigma is destined for failure. Finally, the fourth requirement is a Six Sigma-imbedded culture that supports change and that works well with the initiative. Without

one or more of these criteria, it is no wonder why individuals and organizations might come to the conclusion that Six Sigma is just a "fad" and "not worth the hype".

First of all as mentioned before, the capital outlay and upkeep needed for a successful Six Sigma program can be staggering. Given the example of General Electric as outlined previously, there is much that can be taken away from the cost that their organization spent on implementation of Six Sigma. In the period from 1996-1999, the company invested a reported $1.6 billion in Six Sigma (Waxer). Granted in that period, they also managed to save a reported $4.4 billion (Waxer). However, the point of the matter is that the cost of quality is not cheap and more specifically that Six Sigma is not cheap. General Electric is an extreme example of Six Sigma in both the expense and savings category. However, companies can probably expect to see a similar (1: 3 or 4) return on investment if they implement the system as it is intended.

Besides the initial capital outlay, most Six Sigma deployments need full-time Black Belts and Champions to streamline the process and make sure the investment is worth it. These associates also need to be trained and continuously kept up to date, requiring more labor and training hours. One company might have hundreds or even thousands of Black Belts, not to mention the other employees they have working on Six Sigma. Many times these individuals have to attend workshops, meetings, and participate in conference calls that take up a great deal of time. These extra requirements are not even including their project requirements that can last up to a fiscal quarter. Excluding Black Belts, some individuals like Green Belts are still expected to produce the same amount of work they did before often times. In many cases, success in this area can simply be attributed to a case of impeccable time management and how well the company can adjust and adapt to the labor layout changes. The deployment must be organized, well-planned, and coordinated in order for the capital outlay to be achieved efficiently.

Also, the time of upper management must be figured into the equation of capital outlay required. As discussed before, management must be truly on board with the whole operation. If they cannot give their time to the Six Sigma efforts, then the entire thing will eventually become null and void. Thus, they will need to have extra time made available to guide the operation of the initiative. Many companies have realized that Six Sigma does not work when the leadership is not able to make the time and energy commitment. In fact, everyone's time has to be valued based on what is not getting done because of involvement in Six Sigma. The work that is not done due to Six Sigma commitment still has to be accomplished somehow. Unfortunately, someone may ultimately have to be hired or redirected to manage the work. As employees are brought on board with Six Sigma, their jobs have to be filled. Recruitment and hiring costs associated with this can also be staggering. However, one must realize that some of the labor cost incurred by the organization cannot officially be attributed to Six Sigma, because many people would still be on the payroll regardless of the presence of Six Sigma.

Commitment and follow through are very integral to the Six Sigma experience as well. A Six Sigma deployment and continuous improvement using the system once it is in place is not to be taken lightly. Take for instance, the following example describing what former CEO of Motorola Bob Galvin did when he needed to invigorate commitment to his organization. His goal was to "improve product and service quality 10 times by 1989, and at least 100-fold by 1991. Achieve Six Sigma capability by 1992" (Cyger, "Fear of Commitment"). This goal was something that was looked at as being very aggressive, especially back in 1989 when Six Sigma was just starting to gain popularity. It would be an arduous task to explain to Galvin why a particular unit was not improving quality and efficiency after a statement like that. The statement shows commitment and attention to detail that is integral in the process of Six Sigma.

Furthermore, Jack Welch was once quoted on the topic of Six Sigma by stating that it was "the most important initiative GE has ever undertaken" (Cyger, "Fear of Commitment"). Again, if the CEO of an employee's company is saying that it is "the most important initiative" the company has ever undertaken, the employees have a great motivation to take the change and embrace it. However, if the employee sees that the top leadership is not committed, one would not care as much about the initiative. Again, it all comes down to commitment and the desire to succeed. If the company has no full-fledged interest in the outcome of the initiative, there is no motivation for organizational change and progress.

Another important facet of the successful Six Sigma approach is the idea of follow through. Often spoken words of wisdom proclaim, "Anything worth doing is worth doing right." After all, a company that spends its money on a new machine or initiative should make sure that the money was not wasted. With Six Sigma not much changes as far as follow through is concerned. It is very important to make sure that the Six Sigma team is well equipped and supported. Without this support and equipment, there is a dramatic reduction in the success and moral of the team. "The lesson for Six Sigma deployment leaders and their CEOs is clear: if you're going to do Six Sigma at all, go all the way" (Cyger, "Fear of Commitment"). This quote describes how important it is for companies to have an impeccable plan immediately and follow through in the beginning.

This is just one aspect of follow through, however. Not only does the average organization need to ensure that their implementation stage is well supported and consistent, it also needs to make sure that, as time passes, the early success does not wane. As capital resources are used to make the projects and personnel successful, the organization cannot ignore

what it has already accomplished. There is a tendency to perfect one area of the business, and then move on.

However, when the organization moves on, the previous successes must still be maintained. If not, there might have to be Six Sigma projects on how to fix previous projects. Take for instance a situation where a project is started and progress is made only to later be ignored and allowed to relapse. The money, time, and effort are put into the process to get it to work. Every member of the team could be fully committed to the cause, but if the actions and changes created by the Six Sigma team are not embraced and firmly reinforced, there will not be long-term success. This would be counter-productive and a massive waste for the organization. With this discussion, it is clear follow through is integral to the process of implementing and maintaining Six Sigma.

The final integral feature of the organization that attains success with Six Sigma is a compatible culture that embraces change. Initially, it might be hard to imagine an organization that actually is able to have a culture that fits with Six Sigma. So far everything that has been described has made Six Sigma seem like some magic, unattainable feat. That is not uncommon in the business world either. Taken from Jack Welch's book *Winning*, he shares, "I'm exaggerating a bit, of course, but it is fair to say that for many people, the concept of Six Sigma feels like a trip to the dentist. But Six Sigma couldn't be less like a root canal or any other awful procedure. Done right, it is energizing and incredibly rewarding. It can even be fun" (246). This description of Six Sigma given by Jack Welch is probably why people in the business community do not like the idea of Six Sigma. It is precisely for this reason that the culture at the company must be accepting of change. Six Sigma is not necessarily the horrible experience described above, but the culture must be willing to accept the change that Six Sigma presents. It

has already been explained that Six Sigma is all about change. For this reason, if the culture of the organization is not capable of accepting that change, there is no wonder why many organizations have poor success rates or unfulfilled goals.

The business must have a culture that supports communication as well. Frequently, studies come out that say that the number one quality that businesses want newly hired employees to have is good communication skills. It is no wonder that they want new prospects with communication skills, because communication is one of the most important skills one can learn. It seems simple, but in reality many organizations struggle with the simple concept of communication. More specifically with regard to Six Sigma, the communication must be top-down more so than any other path. Top-down communication is so imperative in the Six Sigma initiative because the top of the organization sets out the goals for the entire process. If there is not enough communication between those policy makers and the project managers and other personnel, little success can be achieved.

Communication can be taken so many ways in an organization. If the leadership of the company cannot communicate their goals, the goals cannot effectively be made the goals of the people on the job. It is a fact that "when people understand the why of an objective they accept the what of activities more quickly. They also apply their energies more freely" (Gupta, "Performance Handbook" 54). This explains exactly why organizations see both failure and success with their initiatives. If the company leadership explains things thoroughly and explains the "why", there will be a greater sense of understanding and ownership. Conversely, the reverse is true.

All in all, there must be accountability in the organization for the development of both a change and communication-based culture that is dedicated to the betterment of the whole. One

strategic unit might succeed for a while and look good having success with Six Sigma, but without the entire operation being supported universally, the organization is only setting up the Six Sigma initiative for a slow and miserable death.

IV. What Causes Six Sigma to Fail?

Six Sigma is an initiative that must be taken very seriously, and meticulous planning is a must. If for some reason there is a reason for Six Sigma to fail, the lack of planning probably would rank very high on the list. However, there are other attributes or the lack thereof that can put Six Sigma projects and deployments on the fast track to mediocrity or even worse. It is important to not only realize that the following are reasons why Six Sigma fails, but also that by doing the opposite, a company can reach success. The following causes of unsuccessful Six Sigma attempts are very vital to understand. Collectively they represent a lot of areas that can be addressed in an organization. Consequently, the four key characteristics that are mentioned above are critical for any successful initiative. They are fundamental and cannot be overlooked. However, the following reasons are more specific and focus more in depth on areas that companies have previously struggled with.

Sometimes companies can get caught up focusing too much on the bottom line. Being that the bottom line is very important to executive leaders, the board of directors, and shareholders alike, it is very likely that the leaders of the Six Sigma program will be focused on the bottom line as well. However, it can be an issue when focusing on the bottom line becomes the goal instead of a result of the goal. Take for instance a company that focuses purposely on gaining a higher profit through the use of Six Sigma and a company that focuses on creating customer relationships and quality. Imagine these companies were put side by side and one could pick which he did business with. It is reasonable to assume that he would pick the company that

focused first on creating customer relationships and quality before profit. This at least seems like the more admirable approach. This is just the beginning though, and there are many situations that are not as cut and dry.

"To improve profitability, a business must increase sales, reduce the SGA [Sales and General Administrative] expenses, and reduce the cost of goods sold (in that order). Of course, there is a tradeoff between the three variables, so a balance must be found to maximize profitability" (Gupta, "Business Scorecard" 164). It is most important for a company to realize this fact. Obviously profitability and the bottom line are a big focus, but they absolutely cannot be the only focus. Six Sigma is not a tool for profitability. The only way the likes of Motorola and General Electric turned it into a profitable experience is through dedication to increase sales, quality, and the transfer of Six Sigma savings to the bottom line. Consequently, if an organization is thinking about or currently implementing Six Sigma, they should ensure that they are not doing it merely to become more profitable. Profitability is a byproduct of Six Sigma, not the focus.

Just as in the pizza delivery example that was given earlier, the company could have decided to deliver pizzas in 25 minutes with Six Sigma quality. This might have cost the company more money in the beginning, but due to the reduction in variation of their operations, customer service and satisfaction probably increased, and over time their profitability will increase. This along with many others situational decisions regarding variance and quality are something that businesses must decide every day. Jack Welch is once commented on profit and Six Sigma saying:

> The best Six Sigma projects begin not inside the business but outside of it, focused on answering the question: how can we make our customers more competitive? What is critical to our customers' success? [...] One thing we have discovered with certainty is

> that anything we do that makes the customer more successful inevitably results in a financial return for us. (Abramowich 59)

All in all, if a company is focusing too much on the bottom line with their Six Sigma initiative, it will most likely suffer because the focus is on the wrong element. The customer must remain the most important aspect of the Six Sigma initiative, and many organizations fail to see this. It is clearly evident that Jack Welch and General Electric realized that the customer is vital to the process, and the company's success is astounding. Thus, profitability does not equate to quality and reduction of variation. However, quality and reduction of variation very well may equate to profitability.

Project supply, selection, and support are another collective area that is sometimes problematic for companies in general. In reality, projects are what make the Six Sigma system function and thrive. If it were not for the various projects that are completed, there would not be change in the way most Six Sigma initiatives attempt to create it. Thus, the projects themselves are the backbone of the process from a non-human resource point of view. Therefore, it is incredibly significant that the projects be on line with the organizations goals and capabilities. The following are descriptions of what can go wrong with project supply, selection, and support. All three categories work together in a way, so they can be talked about collectively and separately as well. It is when companies cannot succeed in coordinating all of their project related requirements that a failure or significant decrease in Six Sigma productivity can be seen.

Poor project supply is the first issue for companies to overcome. If there is not a constant pool of potentially successful and worthwhile projects to participate in, then the Six Sigma process will literally die. Some of the changes that had been made in the past might survive for a while, but without constant attention to detail and motivation to change, it is hard to make the changes become permanent. "Six Sigma goes beyond defect reduction to emphasize business

process improvement in general, which includes cost reduction, cycle-time improvement, increased customer satisfaction, and any other metric important to the company" (Pyzdek, "Ignore Six Sigma"). Therefore, a company must have a means by which it defines areas for improvement. Many areas can be worked on through Six Sigma, but the main attitude that must be addressed in regard to project supply is change. While the point is a bit repetitive, it cannot be stressed enough that a change-oriented culture must be constantly looking at everyday activities through very critical eyes. In other words, employees of the company that is deploying Six Sigma must be highly encouraged and motivated to bring ideas for daily improvement up at meetings, to superiors, and to other coworkers. Without their input, no Six Sigma system alone would be able to make much of a difference at all. Many organizations cannot seem to sustain Six Sigma growth, and the lack of continuous change and project supply could contribute greatly to the problem.

Project selection is the second step in the logical progression of project-related concerns when it comes to Six Sigma. Once a supply of potential projects is present, it is up to the organization, more specifically the executive leaders and the Six Sigma team, to decide what projects to commence. It is recommended that companies come up with a list of criteria to which they target through a series of projects. "Often organizations develop targets such as *savings per project*, and *expected time to project completion*. Project-selection criteria also communicate what types of improvements are important to the organization" (Snee and Hoerl 128). Through this process, a company should easily ascertain the correct projects to suit their goals. It turns out that companies are often failing at defining their project criteria. Instead of letting each employee know what the firm is targeting in its initiative, the firm makes it more like guesswork.

Furthermore, some companies publish project-selection criteria that is unreasonable or that never gets adopted by the workers on the ground floor.

Project selection is a topic that troubles many companies, and rightfully so. Choosing a project scope and employees to work on that project are troublesome in many cases. "Six Sigma teams must ensure that improvement projects are selected wisely to yield maximum results for the business. Companies that do not have a good approach to project selection often find it difficult to sustain the initiative" (Abramowich 56). Companies must realize that all problems cannot be solved in one project or with one wave of projects. Instead, it is a cumulative effort, and one that must be given time to work. Much to the dismay of many companies who have "failed" when using Six Sigma, such companies fail to understand the importance of this simple attribute. Instead of focusing on the small steps, they focus on making big impact fast. By doing this, they ignore easily solved problems that are a big source of cost, instead opting to dig deep for inefficiency and variance that might not be worth the trouble to find. Even if it is worth digging for and working incredibly hard to find these inefficiencies, it might render the Six Sigma team and the company as a whole on much more negative terms with the initiative. This is one main way Six Sigma earns a bad name at companies and corporations.

The scope of the project is also something to consider, because it can become too broad or narrow. Greg Brue comments in the book *Six Sigma for Managers* saying, "The scope of your project should be manageable, but not so narrow that the solution is already in front of you. If the solution is in front of you and you know it, then you should just do it and don't waste your Black Belt's time. Keeping your project focused keeps the objectives clear and puts all your Six Sigma resources to their best use" (134). Again, many companies that fail with Six Sigma do so in this area as well. They do not adequately and appropriately designate the scope so the project is at the

proper level. Also, it is imperative that the projects costs do not exceed its benefits or cost reductions. Many organizations select projects that sound wonderful, but when all of the numbers are added up, the company actually loses money. This is usually never a positive thing for the organization, and should be avoided. Unfortunately, many companies fail to recognize this as well, resulting in a Six Sigma program that has been drastically undermined.

Finally, project support is quite possibly the biggest aspect of the project related categories of Six Sigma failures. First of all, without the uninterrupted, unanimous support of the executive leadership of the organization no project or group of projects can be easily completed. The executive leadership commits to the entire Six Sigma operation, and as a result, they are the group whose support is most needed. Regarding appropriate action with projects, *Six Sigma: Beyond the Factory Floor* suggests that executive leaders "create and deploy strategy and goals, define boundaries, communicate purpose and progress, provide resources (people, time, and $$), ensure training plan is in place, review overall initiative quarterly, and publicly celebrate successes" (131). Without things like those that are listed above, Six Sigma would and does undoubtedly fail at any organization. Support from the leadership of a company is by and large the best way to ensure success of any Six Sigma initiative. Without it, as many companies have found, there is nothing but malfunction that can result.

Finally, there are a few miscellaneous causes for Six Sigma failure that need to be discussed. One aspect of the initiative that has been brought up before, in part, is complacency. "Six Sigma initiatives are difficult. They require an organization to question itself fundamentally and to reinvent the way it has always done business" (Abramowich 57). As with most things, one has to put a lot of effort into something in order to see success that really exhibits sustainability. Six Sigma is no different in this respect. Once a company has implemented Six Sigma, it cannot

become lazy and complacent. If this happens, and it often does, there can be a loss of overall interest. Six Sigma may actually become the victim of attacks questioning its validity and usefulness. Hence, this is why many organizations and critics learn to think of Six Sigma as nothing but a fad and the latest organizational scam. This can particularly happen at organizations that are experiencing levels of success even before Six Sigma was introduced. "If a company has been very successful, it is natural to think that this success will continue and that such reinvention is unnecessary. [...] When times are good, people are less inclined to commit such changes, even if there is a future threat" (Abramowich 57).

This complacency is exactly why companies run into difficulty with the Six Sigma initiative. There is no way of predicting the future, and many organizations are complacent with how they measure up at the moment. In the long run, this contributes to organization-wide descent and decreased levels of success. Again, it is all up to the executive leadership to help make sure that complacency does not interfere with the goals and strategic imperatives of the enterprise. It is here where the great leaders are separated from the pack, as was seen in the examples of Bob Galvin, former CEO of Motorola, and Jack Welch, former CEO of General Electric. These leaders did not let their teams become complacent, and instead made vast attempts to carry their organizations into the upper echelon of successful companies.

One final error that companies make constantly is that they fail to put their best people on the Six Sigma team. Clearly, Six Sigma is a unique concept and not everyone at the company should be asked to lead the effort. As a result, the most talented people in the organization should be used to help further the Six Sigma initiative. A company that does anything short of this should not expect to get as much out of Six Sigma. Hence, if a company does not put the best of the best in, it will not yield the best results. "Top talent is important to the success of Six Sigma,

as with any human endeavor. [...] In addition to the obvious fact that top talent will be able to deliver the best results, it is also true that many people, especially those 'sitting on the fence' relative to Six Sigma, will judge the effort by those with leading roles" (Snee and Hoerl 98). Furthermore, people pay attention to those leaders around them who are involved in the business and its daily activities. If the leaders are involved in a business unit or initiative, such as Six Sigma, their fellow coworkers will acknowledge the operation to be something worthy of attention. However, if the second and third rate employees of the organization are the only ones working on Six Sigma, its success will be greatly compromised due to the poor public figureheads of the operation (Snee and Hoerl 98). Companies cannot afford to let Six Sigma become viewed as some circus or half-baked idea from the corporate boardroom. Unfortunately, many times this can happen, further introducing indifference and lack of enthusiasm that can kill the entire operation.

"Another important reason for involving top talent is that these people will become the future leaders of the organization. If these men and women have experienced Six Sigma first hand and seen the results it can deliver, they will ensure that it becomes a lasting part of the culture" (Snee and Hoerl 98). Many corporations do not see the value in this, and perhaps that is why they have not experienced the success that other organizations have with Six Sigma. When it comes down to it, this point makes very practical business sense. As with many things in life, if one wants to get an idea supported, he goes to see those who people respect and who are the leaders in their peer or business group. Six Sigma is no different in this respect, and top talent is essential to the operation. Companies that fail to acknowledge that top talent must be made part of the Six Sigma team are not addressing one of the main aspects of Six Sigma.

V. Six Sigma Misconceptions

As with many things that gain popularity so quickly, Six Sigma is surrounded by a number of misconceptions that are often very ambiguous and lack substance. Because Six Sigma has brought some companies great success and others results that were hardly spectacular, many individuals have their own opinion about Six Sigma and how successful it is as a company-wide program. One of the main misconceptions that need to be addressed is the notion that Six Sigma has a negative affect on the stock price of the company that deploys it. Another notable misconception concerning Six Sigma is that the process is a "magic bullet" for creating automatic success to the deploying company. Neither of these is true, and both must be analyzed to clear up the confusion regarding Six Sigma. Clearly, if there are such drastic misconceptions about Six Sigma, a certain indication is given that the overall process is not very well understood by the business community. In hopes of making these confusions more realistic, the stock price and "magic bullet" theories need to be explored.

Regarding stock price and Six Sigma, there has been significant discussion in recent publications. Six Sigma is not the only quality improvement program that is being marketed to businesses by consultants these days. One other competing quality improvement program is called QualPro. QualPro was founded by Charles Holland, and has been used by the likes of Lowe's, Big Lots, and CarMax Inc. (Richardson). According to Holland and his study, "Of the 58 companies reviewed in the QualPro report, 52 underperformed the S&P 500 index from the time they launched their Six Sigma programs through Dec. 5, 2006" (Richardson). It is very interesting that the QualPro report, a competing company, would find this in a study of the stock prices of the companies that have used Six Sigma. The accuracy of the study is most likely not to be discredited, because all of the companies that are publicly traded probably did disclose

exactly when they started their Six Sigma initiative. Obviously, one could analyze the stock price of all of the companies in order to come up with the "conclusion" that the companies' stock price was influenced by their use of Six Sigma.

Jeffrey Pfeffer, an opponent of Holland's argument and a professor at Stanford University explains, "Quality programs are not designed to be measured by a company's stock price" (Richardson). Furthermore, "improvements generated by Six Sigma, he adds, 'may or may not be reflected in the stock price'" (Richardson). This makes sense because there are very different aspects that affect stock price. It is not very apparent that Six Sigma is one of these aspects, even though Mr. Holland's study had revealed that the stock price of the majority of companies slipped after their deployment. The study does not note other variables that might have affected the stock price of these companies, and this is a very critical in understanding Holland's counterargument. It is utterly ridiculous to say that stock price declined simply because of Six Sigma. However, Holland believes that there is enough evidence that Six Sigma is not that wonderful and he claims that stock price is an adequate indicator of a company's overall performance (Richardson). Clearly, there is disagreement on this issue of stock price and Six Sigma. However, it is reasonable to believe that both parties are correct in some respects. The stock price of these companies did in fact decline, but whether or not it was due to Six Sigma remains to be seen. Finally, stock price is not a true reflection of the quality program the company has in place and was never designed to do anything of the sort.

Stock price is a function of a number of relationships and figures. "The principle theory is that the price movement of a stock indicates what investors feel a company is worth. [...] [In addition,] the price of a stock doesn't only reflect a company's current value, it also reflects the growth that investors expect in the future" ("Stock Basics"). The article goes on to state that the

main factor that drives share price is the company's earnings. With these things said, when it comes to Six Sigma it is very hard to compare it to the attributes that actually drive share price. For instance, what investors feel a company is worth might be very hard to ascertain based solely on Six Sigma. Also, a company's worth has little or nothing to do with Six Sigma, because while savings may or may not be generated, there is not always an increase of net worth. Six Sigma is just a plan for improvement, not a plan to adjust stock price. In addition, the article mentions that the main factor driving share price is company earnings, which again are not directly or in some cases at all influenced by Six Sigma. Earnings are directly related to profits, and Six Sigma does not directly deal with profits. Rather, Six Sigma deals with defects and quality. Finally, "the main reason Six Sigma is no guarantee of stock market success is also the most obvious one: Defects don't matter much if you're making a product no one wants to buy" (Clifford). Ironically, this argument drives home a fantastic point. If Company X is selling something that no one wants to buy, the product could be of great quality and free of defects, but no profit would be made because Company X would not be generating revenues. Without profits there is no increase in earnings, and theoretically no increase in share price.

Keep in mind that many of the companies that are using Six Sigma have not been doing so for very long. Perhaps they are all selling products that no one wants to buy, or perhaps they are still working on becoming more efficient in their operations. Nevertheless, stock price has very little if anything to do with Six Sigma, and vice versa. There can be a complicated connection drawn to these two entities as was done above. Yet, the relationship, if one exists, is a senseless idea, and one that was pioneered by a Six Sigma opponent. It would figure that Holland, founder and CEO of QualPro, has found a negative trend to exploit for his company's benefit. Still, one major point must be made. Just because it might have been found that stock

price declined with relation to the introduction of Six Sigma does not mean that the two things had anything to do with each other. As many scientists would argue, correlation does not prove causation.

The final main misconception regarding Six Sigma is that it is a "magic bullet" and that it will instantly make things better at a company. Ever since Motorola and General Electric have had such great success with Six Sigma, other companies automatically assume that it was easy and painless. Instead, many overlook the consciously aggressive attitude that Bob Galvin and Jack Welch took with Six Sigma. For them, failure of the initiative was not an option. Because the changes at these companies took place in only a few years, the "magic bullet" theory started to develop as a means to classify what happened at Motorola and General Electric. However, Six Sigma is most certainly not a "magic bullet" by any means. To think that it is seems quite silly when one really analyzes it to a full extent. Robert Ferris, a spokesman for Honeywell is quoted saying, "Six Sigma is not the end all be all. [...] It is simply a set of process tools. We would never suggest that a company's performance is solely linked to the adoption of these tools" (Richardson). Evidently, as can be seen in the argument that Six Sigma is a "magic bullet", there is still a false impression that Six Sigma fixes all problems quickly, and can be used to boost productivity and profit generously in a very short time. It is not impossible for an organization to do each of these things. However, to think that Six Sigma will automatically and effortlessly get them all accomplished is idiotic.

Success with Six Sigma is something that does not come for everyone. In fact, several companies have tried to use Six Sigma for everything, including tasks that it was never designed to handle. Without a clear understanding of what Six Sigma is designed for, it is no wonder this mistake continues to happen. In fact, take into consideration the following:

> Six sigma is not a magic bullet, says Pyzdek, who reports having seen numerous companies trying to apply the methodology where it doesn't make sense to. 'I see it being applied wall-to-wall, and that's wrong,' he says. 'For instance, if you have an R&D department, I would apply it to the development part but never to the research part. Six Sigma is methodical and organized. Research is sloppy, chaotic, and disorganized. You would kill the creativity of research if you tried to apply it there'" (Dusharme).

This analysis of Six Sigma helps create understanding as to why organizations do not all have the same astounding success with the initiative. It was mentioned before that Six Sigma should be implemented either all the way across a business or not at all. Too many companies were trying to roll it out into segments, taking time while doing so. This tactic really hurts the Six Sigma goal of drastic change. However, the example above shows how a company who is rolling out Six Sigma in a full deployment might "over-do" it. Dusharme continues in his article by saying that some companies ineffectively want to use Six Sigma to consolidate plant space. This decision could be made without Six Sigma, and would be a potential waste of a Black Belt's time.

It is apparent that companies are not quite sure how to use Six Sigma, and this is not necessarily their fault. The concept is confusing at times, and hard to understand for most people. Still, what needs to be understood is that Six Sigma is by no means the magical solution to every business problem. It takes time, dedication, support, and follow-through much like any other worthwhile objective in life does. If every company could try Six Sigma and succeed significantly, it would not be as impressive because there would be no separation of the great companies from those that are lackluster. With Six Sigma, it is survival of the fittest, and the company that stays "alive" is the one that is 100% dedicated to the cause.

Finally in regard to Six Sigma being the "magic bullet", according to Pfeffer, "You can't just do one little thing. [...] Low cholesterol is just one measure of health. In the same way, quality management is just one piece of the puzzle, but not the answer to the whole puzzle" (Richardson). Pfeffer could not be more correct, because Six Sigma is only one aspect of a

company's operations. Once the focus on Six Sigma is removed, it is quite possible that companies who succeed while using Six Sigma are doing other tremendous things as well. Either way, Six Sigma gets associated with the downfall or success of the organizations that use it because it has not been fully accepted by the business community. However, those who know Six Sigma and use it in their organizations realize what Six Sigma is. Put simply, it is one of many tools to help control quality and reduce variance in processes. It is neither a ticket to the Fortune 500, nor a ticket to bankruptcy. Nonetheless, either could happen depending on the execution of the Six Sigma system. The success one has with the initiative is up to the investment and dedication that is made on behalf of the company deploying Six Sigma.

VI. Six Sigma: Absolutely Worth the Hype!

After the lengthy discussion of Six Sigma that has preceded this section, it is now time to ultimately come to a conclusion if Six Sigma is worth the hype or not. Taking into account the description of the savings that well-run companies have had with the initiative and coupled with the quality that is at stake, there is really a compelling reason to implement Six Sigma. With most companies operating "happily" at three or four sigma, there is no wonder that a drastic jump in quality to Six Sigma would surprise many. However, this quality is needed more than one can imagine.

> Six Sigma means being 99.9997% perfect. That may seem like overkill until you consider that settling for 99% perfect – closer to 3 or 4 sigma – means:
>
> - 20,000 lost articles of mail per hour
> - Unsafe drinking water almost 15 minutes each day
> - 5,000 incorrect surgical operations per week
> - Two short or long landings per day at each major airport
> - 200,000 wrong drug prescriptions each year
> - No electricity for almost seven hours each month
>
> (Jones)

When the numbers are equated into easily understood terms, as they were above, it is much simpler to calculate the importance of quality. While Six Sigma is barely 20 years old, it still is amazing how things used to be in the 1970's and early 1980's. With consumers' backs turned on quality, several manufacturers and service providers were not forced to manufacture a quality product. Nonetheless, in today's world the need for quality is rapidly changing. This explains the rising prevalence of Six Sigma in corporate America. Without the likes of Bill Smith, Bob Galvin, and Jack Welch, who knows where Six Sigma would have been today. The importance of quality shows no sign of letting up, and this will probably catapult Six Sigma into a permanent spot atop many corporations in the business world.

Larry Bossidy, former CEO of Allied Signal and current CEO of Honeywell, is quoted saying, "The fact is there is more reality with this [Six Sigma] than anything that has come down in a long time in business. The more you get involved with it, the more you're convinced" (Jones). Bossidy could not be more correct in his assertion about Six Sigma. It would seem that most critics of Six Sigma are those who do not know much about the initiative. This is a correct assumption because if they have not read much about Six Sigma or had any experience with it, they would not be very knowledgeable. If these individuals were critical after this exposure to Six Sigma, they could be considered as novices in the process, and not experts. Furthermore, other critics are those who have not experienced success with Six Sigma. With regard to these critics, it could still be deducted that they do not know enough about the process. Six Sigma is a process that one must know a lot about before beginning. With the examples that were given earlier, there are quite a few things that companies must do correctly, and another assortment of pitfalls that they must avoid. Without following these criteria, their failure with Six Sigma is not an accident, it is expected.

Not only is quality an extremely necessary component in today's business processes, cost savings are also important. This is another reason that Six Sigma is absolutely worth the hype. Cost savings by Six Sigma are potentially very large if the company is operating efficiently and properly. Even though the Six Sigma system potentially adds quite a few employees to the mix and payroll costs increase, there are potential savings that can be realized that are tremendous. "Given that most black belts can tackle more than one project at a time, completing three to five projects a year is customary. With an average savings of $188,000 per project, that means a company can count on more than $500,000 of savings per year, per black belt" (Cyger, "Missing Link"). Therefore, huge savings for the company can be achieved by using Six Sigma. Whether or not this savings is transferred to the bottom line and to shareholders is up to the company, but either way, it is win-win. If the savings do not see the bottom line that means that other investments in human resources and materials are being made that would not normally have been able to be made. This creates a huge competitive advantage, and helps reinforce why Six Sigma is such a catch phrase in today's business environment.

The capital outlay needed for Six Sigma might turn some potential companies away from implementing it. Yet, Six Sigma is money well spent. "Money spent on eliminating root causes, improving operational efficiency and education usually benefits the firm beyond the current period, so these expenditures ought not to burden only a single period. [...] Money spent on Six Sigma should not be a cost; it should be an investment" (Bisgaard, Soren, and Freiesleben). Six Sigma is just that, an investment. However, many firms do not consider it an investment, and expect to get a lot out of the initiative without putting anything in. This is a erroneous belief and it helps explain why companies struggle with Six Sigma. With the right inputs, Six Sigma can and will work for a firm.

Six Sigma is not just for eliminating defects and variance in processes, it has many more uses as well. Take for instance that it can have extremely positive effects on a firm's ability to service its customers effectively. With reduction in variance, customers are able to expect more quality and reliability, which is the number one expectation of customers. "A huge part of making your customers sticky is meeting or exceeding their expectations, which is exactly what Six Sigma helps you do" (J. Welch and S. Welch). Ultimately, when a firm's customers are happy, it reaps the benefits. A big argument earlier on was that profitability is automatically attained when a company's customers are satisfied. Customers should be the number one priority in any business, but in many they are an afterthought. Businesses tend to get hooked on the notion that in order to be profitable, they need to focus on profits. This can be true, but it will eventually alienate the customer and during that time of alienation, the customer will be finding a company that does take care of them. Six Sigma, consequently, helps a company take care of its customers in ways that other companies who are not using Six Sigma cannot. For this reason and countless others, Six Sigma is worth the hype.

Last but not least, a qualification must be made regarding small to medium sized companies. For these companies, Six Sigma might be more difficult in the sense that the capital outlay might become too much of a burden, or management might not have the time to dedicate to the program. To these companies, Six Sigma might not be the best process to introduce, but for others it certainly is a way to sustain market share and make customers happier. "Six Sigma doesn't solve all problems and it shouldn't be applied in all situations. But, if it's a measurable, methodical process that you are trying to improve in order to get bottom-line results, Six Sigma might be the ticket" (Dusharme). With that said, companies should heavily weigh the availability of resources at their disposal before bringing Six Sigma on board. In conclusion, Six Sigma can

help make change, but it cannot be the only resource attempting to make the change. Full support is needed, as Six Sigma is probably like raising a small child. First of all, not everyone is best suited with a child, and some cannot handle the responsibility when they wind up with the child. In the beginning it takes some getting used to, and its parents play a big role in development. When the child has grown, it is able to repay the parent's ten-fold for their efforts, and the two are able to complement each other.

With all things said, Six Sigma is most certainly worth the hype. It has created large successes in its relatively short lifetime, and has grabbed the attention of many in the business arena. For the reasons described in the text as well as those just mentioned, Six Sigma deserves to get all of the attention it receives. While it was not a necessarily new concept, it had never been applied in business, and now is widely applied. There are by far more companies that are glad they are utilizing Six Sigma than those that regret the decision. Again, those that regretted the decision were unprepared and should never have gotten themselves into Six Sigma. Finally, the bottom line improvements, cost savings, and increases in customer service are by far more than enough to reaffirm that Six Sigma is here to stay, and in a huge way. Without knowing what Six Sigma was, one might never consider its possibilities, but once being introduced to the concept; one cannot help but wonder, "What if?"

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